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SHALLOW WATER FISHES OF THE EAST (INDIAN OCEAN) AND NORTH EAST (GULF OF ADEN) COAST OF SOMALIA

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Although by no means an authoritative work, this checklist describes some of the inshore marine fish species found along the east and north-east coasts of Somalia, and is therefore a useful addition to marine faunal surveys in an area which has been relatively poorly studied. A total of 96 species from 46 families was recorded in the Indian Ocean between Barmadohe and Dudura, while 34 species belonging to 17 families were recorded during a single dive in the Gulf of Aden, near Bosaso. This paper provides verification of the distributions of some of the fish species compiled from the literature by Sommer et al. (1996) as well as a number of new fish distribution records.

INTRODUCTION

The Somali maritime zone is one of the largest in the western Indian Ocean and has one of the most important large marine ecosystems (the Somali Current Marine Ecosystem) in the Indian Ocean. A feature of this ecosystem is the seasonal upwelling and consequent high productivity resulting from the Somali Current. The coastline is approximately 3,300 km long and is divided into two major coastal areas.

The north coast is bordered by the Gulf of Aden and is about 1,300 km, while the 2,000 km east coast forms the western edge of the Indian Ocean. The continental shelf is relatively narrow in most places and rarely exceeds 15 km in width although it extends to 80 km offshore in the north-east region around Haafun. Along the east coast, the south-west monsoon occurs from May to August, and the strong winds generate a fast flowing current which travels in a north-easterly direction during this period. As the surface current approaches the Horn of Africa, it deviates away from the coast, and the water in the coastal zone is replaced by cold, nutrient rich, up-welled water, which results in high productivity in the area. During the north-east monsoon (December–February), current reversal takes place, but the south-westerly current is not as strong as the north-easterly current, and no upwelling takes place (Sommer *et al.* 1996; Baars *et al.* 1998). During the inter-monsoon periods (October–November and March–April), the winds are relatively light and the seas settled.

Little biological or ecological work has been done in recent times along the Somali coast because of the civil war that raged during the early 1990s

and the subsequent political instability of the country. Bock (1996) has provided a checklist of coral reef fish from the Diani and Galu lagoons in Kenya to the south, and a recent checklist of fish species captured by trawlers operating between 20 m and 300 m depth in the Gulf of Aden and Arabian Sea has been provided by al Sakaff and Esseen (1999). However, fish species occurring in the cooler, upwelling, phytoplankton rich waters of the Somalia coast are likely to differ considerably from those of the tropical, nutrient poor waters of the Kenyan coast to the south and the Red Sea to the north. Furthermore, many inshore species do not occur in the deeper waters frequented by trawlers. The most recent information on the marine biota of the Somalia region is a checklist of living marine resources compiled from the literature by Sommer *et al.* (1996). The authors state that the list is not comprehensive as it was not possible to travel to Somalia to sample fish in the field.

During the course of a recent lobster survey conducted along the east coast of Somalia (Fielding and Mann, 1999), considerable diving work was undertaken (both SCUBA and snorkel diving) and a number of fishing villages were visited. All fish observed by us underwater or captured by fishermen, were identified and noted as part of an additional information gathering exercise. These data are presented here and provide some interesting new fish distribution records.

METHODS

Nomenclature

Species names used in this checklist are taken from Fischer and Bianchi (1984), Smith and Heemstra (1986), Debelius (1993) and Sommer *et al.* (1996).

Study area

Originally, the lobster survey was intended to cover the area between Benda Beyla and Eyl in the western Indian Ocean (Figure 1). On reaching Dudura 50 km south of Benda Beyla political problems arose, and on relocating to Eyl the situation became life-threatening. The diving team therefore returned to Benda Beyla and worked by sea as far north as Barmadobe. The survey thus eventually covered the area between Dudura and Barmadobe, a distance of approximately 133 km (Figure 1).

Sources of fish examined

Dive sites were selected randomly on the basis of boat travelling time and the availability of subtidal reefs. The diving was done from an open 6.5 m GRP boat powered by a 15 hp outboard motor. Altogether, 35 sites between Barmadobe and Dudura were dived to assess lobster densities. Almost all these sites were situated close inshore on shallow rocky reefs 2-6 m deep. Extensive efforts were made to locate deeper reefs with an echo sounder, but with limited success, and there appeared to be little local knowledge of deeper reefs. However, three dives were made north of Barmadobe, on



Figure 1. Map of Somalia showing study area in Western Indian Ocean.

reefs further offshore at depths of 8–14 m. All dives were of 30 minutes duration. A single snorkel dive at 4–6 m depth and lasting approximately one hour was made on a coral reef just north of Bosaso in the Gulf of Aden. During the course of a dive, one diver would swim transects, counting lobsters and the other diver would range freely capturing lobsters. All fish observed during the course of a dive were noted on underwater slates and identified using Debelius (1993),

Sommer *et al.* (1996) and Richmond (1997). At every fishing village visited, fish discarded on the beach (mostly originating from the by-catch of lobster tangle nets) were identified, as were the elasmobranch species that were being salted and dried for later sale. At Eyl, a line fishery for reef fish has started recently and fish present at the cleaning tables were identified. Local fishing boats encountered at sea were also visited to identify fish species captured, and the diving team trolled

fishing lures en route between dive sites.

RESULTS AND DISCUSSION

A total of 96 species from 46 families were identified between Barmadobe and Dudura (Table 1). As water visibility was extremely poor (seldom more than 3 m) it was sometimes not possible to be completely certain of species identification in genera where there are species with similar morphological appearances. Where such uncertainty occurred, the given species is indicated by a question mark in Table 1. Based on the distributions given by Fischer and Bianchi (1984) and Sommer *et al.* (1996), a number of new distribution records were noted:

1. *Argyrosomus japonicus*

A shoal of large *Argyrosomus* sp. (~10 kg per fish) were observed in shallow water near Kulule. Unfortunately the external morphology of *A. japonicus*, *A. hololepidotus* and *A. thorpei* is very similar (Griffiths and Heemstra, 1995) so it was not possible for the authors to distinguish which species was seen. However, considering the large size of the specimens observed and their occurrence in shallow, turbid water, they were most probably *A. japonicus*, as this is the preferred habitat of this species (Griffiths and Heemstra, 1995). Nevertheless, none of the above three species have been recorded in the Indian Ocean off Somalia or in the Gulf of Aden (Druzhinin and Filatova,

1979; Fischer and Bianchi, 1984; Sommer *et al.* 1996). This therefore represents a new distribution record. A fourth possibility is that the fish observed may have been *A. regius* but this species has so far not been recorded south of the Red Sea (Fischer and Bianchi, 1984).

2. *Diplodus sargus*

A shoal of juvenile *D. sargus* (< 100 mm TL) was observed in shallow water near Dudura. It is uncertain whether the sub-species was *D. s. capensis* or *D. s. kotschyi*, but based on considerable experience of the former species (Mann, 1992), the first author considers *D. s. capensis* to be the more likely of the two. However, neither species has previously been recorded from the area (Fischer and Bianchi, 1984).

3. *Dinoperca petersi*

Although suspected to occur in this region (Sommer *et al.* 1996), this represents the first verification of the occurrence of this species in the waters off the Somalia coast.

4. *Caranx sem*

Although known to occur throughout the region (Fischer and Bianchi, 1984), this species was not included by Sommer *et al.* (1996) in their description of the marine resources of the area.

A number of the smaller fish species belonging to the families Apogonidae, Chaetodontidae, Cirrhitidae, Holocentridae,

Table 1. Fish species observed on the east coast of Somalia (Barmadobe to Dudura) during November 1998 (species marked with an asterisk represent new distribution records)

FAMILY	SPECIES	COMMON NAME	ABUNDANCE	METHOD
ACANTHURIDAE	<i>Acanthurus gahim?</i>	Black surgeon	*	D
	<i>A. nigricauda?</i>	Epaulette surgeon	*	D
APOGONIDAE	<i>Pogon nigrifasciatus?</i>	Blackbar cardinalfish	*	D
	<i>Sphaeramia orbicularis</i>	Mangrove cardinalfish	*	D
ARIIDAE	<i>Anus thalassinus</i>	Giant catfish	*	D, N
BALISTIDAE	<i>Sufflamen fraenatus?</i>	Bridle triggerfish	***	D
BELONIDAE	<i>Tylosurus sp.</i>	Garfish	*	D
CAESIONIDAE	<i>Caesio teres?</i>	Yellow and blue fusilier	*	D
CARANGIDAE	<i>Caranx sem</i>	Yellowtail kingfish	***	D, N, L
	<i>Gnathodon speciosus</i>	Golden kingfish	*	L
	<i>Pseudocaranx dentex?</i>	White kingfish	*	N
	<i>Scomberoides commersonianus</i>	Largemouth queenfish	*	N
	<i>S. lysan</i>	Doublespotted queenfish	**	L
	<i>S. tol</i>	Needlescaled queenfish	**	D, L
	<i>Trachinotus africanus?</i>	Southern pompano	*	N
	<i>T. baillonii?</i>	Smallspot pompano	***	D, N
	<i>T. boitarduselli</i>	Largespot pompano	***	D, N
CARCHARINIDAE	<i>Carcharhinus limbatus</i>	Blacktip shark	*	N
	<i>Galeocerdo cuvier</i>	Tiger shark	*	N
	<i>Rhizoprionodon acutus</i>	Milk shark	*	N
CHAETODONTIDAE	<i>Chaelodon auriga</i>	Threadfin butterflyfish	***	D
	<i>C. decussatus</i>	Sri Lanka butterflyfish	**	D
	<i>C. kleini</i>	Whitespot butterflyfish	*	D
	<i>C. lineolatus?</i>	Lined butterflyfish	*	D
CHIROCENTRIDAE	<i>Chirocentrus dorab</i>	Wolt herring	***	L
CIRRHITIDAE	<i>Cirrhitichthys callius</i>	Oman hawkfish	**	D

FAMILY	SPECIES	COMMON NAME	ABUNDANCE	METHOD
DASYATIDAE	<i>Dasyatis kuhlii</i>	Bluespotted stingray	*	D
DIODONTIDAE	<i>Taeniura melanospilos/meyeni?</i>	Round ribbontail ray	*	D, N
EPHIPPIDAE	<i>Diodon hystrix</i>	Spotted porcupinefish	*	D
	<i>Drepane punctata</i>	Concertina fish	***	D, N
GRAMMISTIDAE	<i>Tripteron orbis</i>	Spade fish	**	D
HOLOCENTRIDAE	<i>Grammistes sexlineatus</i>	Sixstriped soapfish	**	D
	<i>Myripristis xanthurus?</i>	Yellowtip soldierfish	*	D
HAEMULIDAE	<i>Pomadasys furcatus</i>	Grey grunter	**	D, L
	<i>P. kakhaan?</i>	Javelin grunter	*	D
	<i>P. olivaceum</i>	Olive grunter	**	D
	<i>Plectorhynchus flavomaculatus</i>	Lemon fish	**	D
	<i>P. playfairi</i>	Whitebarred rubberlip	*	D
	<i>P. schotaf</i>	Minstrel sweetlips	***	D, L
KYPHOSIDAE	<i>Kyphosus vaigensis?</i>	Brassy chub	*	D
LABRIDAE	<i>Bodianus macrognathos</i>	Oman hogfish	*	D
	<i>Coris gaimard afncana?</i>	African coris	*	D
	<i>Labroides dimidiatus</i>	Cleaner wrasse	***	D
	<i>Thalassasoma purpuraceum</i>	Surge wrasse	**	D
LEIOGNATHIDAE	<i>Leiognathus daura</i>	Goldstripe ponyfish	***	D
LETHRINIDAE	<i>Lethrinus nebulosus</i>	Blue emperor	*	L
LOBOTIDAE	<i>Lobotes surinamensis</i>	Triplefin	*	N
LUTJANIDAE	<i>Lutjanus caeruleolineatus</i>	Blueline snapper	*	D
	<i>L. fulvus</i>	Blacktail snapper	***	D
	<i>L. gibbus</i>	Humpback snapper	*	D
	<i>L. monostigma?</i>	Onespot snapper	*	D
	<i>L. russelli</i>	Russell's snapper	**	D
	<i>L. sebae</i>	Emperor snapper	*	L
MOBULIDAE	<i>Mobula diabolus</i>	Devil ray	*	N

FAMILY	SPECIES	COMMON NAME	ABUNDANCE	METHOD
MUGILIDAE	<i>Mugilid</i> spp.	Mullet	**	D
MULLIDAE	<i>Panipeneus macronema</i> ?	Band-dot goatfish	.	D
MURAENIDAE	<i>Gymnothorax javanicus</i> ?	Giant moray	.	D
	<i>G. flavimarginatus</i> ?	Yellowmargin moray	.	D
	<i>G. undulatus</i>	Leopard moray	***	D, L
MYLIOBATIDAE	<i>Rhinoptera javanica</i>	Javanese cownose ray	**	N
PEMPHERIDAE	<i>Pempheris adusta</i>	Dusky sweeper	.	D
PLOTOSIDAE	<i>Plotosus limbatus</i>	Darkfin eel catfish	.	D
POMACANTHIDAE	<i>Centropyge multispinis</i>	Brown dwarf-angel	.	D
	<i>Pomacanthus maculosus</i>	Yellowbar angelfish	.	D
	<i>P. semicirculatus</i>	Semicircle angelfish	.	D
POMACENTRIDAE	<i>Abudefduf notatus</i>	Yellowtail sergeant	***	D
	<i>A. sordidus</i>	Spot damselfish	.	D
	<i>A. vagiensis</i>	Sergeant major	**	D
	<i>Chromis viridis</i> ?	Bluegreen puller	.	D
	<i>Dascyllus trimaculatus</i>	Domino	.	D
POMATOMIDAE	<i>Pomacentrus caeruleus</i>	Blue Pete	.	D
PSEUDOCROMIDAE	<i>Pomatomus saltatrix</i>	Shad	**	L, N
	<i>Chlidichthys inornatus</i>	Yellow rockbasslet	.	D
	<i>Pseudochromis melas</i> ?	Dark rockbasslet	.	D
RHINOBATIDAE	<i>Rhinobatus granulatus</i>	Granulated guitarfish	**	N
SCIAENIDAE	* <i>Argyrosomus japonicus</i> ?	Dusky kob	.	D, N
	<i>Otolithes ruber</i>	Snapper kob	**	N
SCOMBRIDAE	<i>Umbra rhombus</i>	Slender baardman	.	D
	<i>Scomberomorus commerson</i>	King mackerel	**	D, L
SCORPAENIDAE	<i>Thunnus albacares</i>	Yellowfin tuna	.	L
SERRANIDAE	<i>Pterois miles</i>	Devil firefish	.	D
	<i>Cephalopholis sonnerati</i>	Tomato rockcod	.	L
	* <i>Dinoperca petersi</i>	Cave bass	.	D

FAMILY	SPECIES	COMMON NAME	ABUNDANCE	METHOD
SPARIDAE	<i>Epinephalus chlorostigma</i> ?	Brownspotted rockcod	*	D
	<i>E. polytepis</i> ?	Smallscaled grouper	**	L
	<i>E. stoliczkae</i>	Epaulet grouper	***	D, S
	<i>E. tukula</i>	Potato bass	*	D, S
	<i>Cheimenius nufar</i>	Saniter	**	D, L
SPHYRAENIDAE	<i>Crenidens crenidens</i>	White karateen	***	D, N
	* <i>Diplodus sargus</i>	Blacktail	*	D
	<i>Sphyræna</i> sp.	Barracuda	*	N
	<i>Synodus dermalogenys</i> ?	Banded lizardfish	*	D
	<i>Arothron melanocephalus</i>	Starry pufferfish	*	D
TETRAODONTIDAE	<i>Terapon jarbua</i>	Thornfish	*	L
TORPIONIDAE	<i>Torpedo panthera</i>	Torpedo ray	*	D
ZANCLIDAE	<i>Zanclus cornutus</i>	Moonish idol	*	D

(Note: A question mark following the species name indicates some uncertainty in identification of the species in that genus)

Abundance

* few seen

** fairly common

*** very common

Method observed

D = Diving (SCUBA and snorkel diving, most dives were < 10m depth)

L = Line fishing (fishing by the survey team and observed line-fishing catches)

N = Gill-netting (both lobster nets and shark nets)

S = Spearfishing (hand-held spears)

Pempheridae, Pomacentridae and Pseudochromidae are not recorded by Sommer *et al.* (1996), primarily because they are not of importance to fisheries. As far as the authors are aware, this checklist therefore represents the first record of these species along the eastern coast of Somalia (Indian Ocean). Unfortunately we were not able to obtain the species checklist compiled by Muller and Dumitrescu (1984) to confirm this.

While traveling by boat between dive sites large shoals of pelagic clupeids were frequently observed near the surface. These shoals of baitfish were often accompanied by large predatory gamefish such as *Scomberomorus commerson*. We were not able to determine the species of clupeid, but discussion with Rudy van der Elst (Oceanographic Research Institute, pers. comm.) revealed that he has observed similar shoals of fish during aerial surveys of the region. He believed that they were probably the Indian oil sardine (*Sardinella longiceps*). However, this needs to be confirmed.

The reefs dived between Barmadobe and Dudura contained very few corals and were dominated by red algae, ascidians and sponges. This is probably because of the high wave action and turbidity encountered on the inshore reefs. However, the reef dived north of Bosaso in the Gulf of Aden was a true fringing coral reef and was characterized by an exceptional diversity of coral reef fishes. In

a single, one hour snorkel dive, 34 species of fish belonging to 17 families were identified (Table 2). The abundance of fishes originating from the Red Sea was clearly evident, and a number of species which were not encountered on the Indian Ocean coast of Somalia were observed.

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The diving survey along the east coast of Somalia would not have been possible without the help of many people. We would like to thank Alex Forbes and Tony Potterton of the IUCN, Eastern Africa Regional Office for coordinating the whole exercise. The staff of Ocean Training Promotions, namely Abdullahi Daib, Abdulisac, Mahomed, Mahomud, Holden, Nur Hagee, Chino and the others in the team, took care of logistics and looked after us exceptionally well under difficult circumstances. Finally we must thank all the village elders, villagers, fishermen and traders who extended



Sergeantfish *Acanthurus* sp.

Table 2. List of species observed on a coral reef just north of Bosaso, Somalia, during a one hour snorkel dive in November 1998 (species marked with an asterisk were not observed during the diving survey in the Indian Ocean)

FAMILY	SPECIES	COMMON NAME	ABUNDANCE	METHOD
ACANTHURIDAE	* <i>Acanthurus</i> <i>scha</i>	Arabian tang	*	D
BALISTIDAE	* <i>Zebriasoma</i> <i>xanthunum</i>	Blue sailfin tang	*	D
	* <i>Rhinecanthus</i> <i>assasi</i>	Arabian picassofish	*	D
CAESIONIDAE	<i>Sufflamen</i> <i>traenatus</i>	Bridle triggerfish	**	D
CARANGIDAE	<i>Caesio</i> <i>teres</i>	Yellow and blue fusilier	*	D
	* <i>Carangoides</i> <i>bujad</i>	Orangespotted trevally	*	D
	* <i>Caranx</i> <i>ignobilis</i>	Giant kingfish	*	L
	<i>C. sem</i>	Yellowtail kingfish	**	D
CHAETODONTIDAE	<i>Scombaroides</i> <i>lysan</i>	Doublespotted queenfish	*	D
	<i>Chaetodon</i> <i>decussatus</i>	Sn Lanka butterflyfish	**	D
	* <i>C. melaplenus</i>	Arabian butterflyfish	**	D
CIRRHITIDAE	* <i>Hemiochus</i> <i>intermedius</i>	Red Sea bannerfish	*	D
HOLOGENTRIDAE	<i>Cirrhitichthys</i> <i>callurus</i>	Oman hawkfish	**	D
LABRIDAE	* <i>Sargocentron</i> <i>diadema</i>	Crown squirrelfish	*	D
	* <i>Gomphosus</i> <i>caeruleus</i>	Bird wrasse	*	D
	* <i>Halichoeres</i> <i>hortulanus</i>	Checkerboard wrasse	*	D
	<i>Labridae</i> <i>dimidiatus</i>	Cleaner wrasse	***	D
	* <i>Thalassasoma</i> <i>lunare</i>	Crescent-tailed wrasse	**	D
LUTJANIDAE	<i>Lutjanus</i> <i>fulvus</i>	Blacktail snapper	**	D
	* <i>L. kasmira</i>	Bluelined snapper	***	D
	* <i>L. rivulatus</i>	Speckled snapper	*	D
	<i>L. russelli</i>	Russell's snapper	**	D
MULLIDAE	* <i>Parupeneus</i> <i>forsskali</i>	Red Sea goatfish	*	D
MURAENIDAE	* <i>Gymnothorax</i> <i>favagineus</i>	Honeycomb moray	*	D
POMACENTRIDAE	<i>Abudefduf</i> <i>vaginensis</i>	Sergeant major	**	D
	* <i>Chrysiptera</i> <i>unimaculata</i>	Onespot damselfish	*	D
	* <i>Dascyllus</i> <i>marginatus</i>	Arabian damselfish	*	D
SCARIDAE	* <i>Scarus</i> <i>ferugineus</i>	Rusty parrotfish	*	D
SCORPAENIDAE	<i>Plomis</i> <i>miles</i>	Devil firefish	*	D
	* <i>Scorpaenopsis</i> <i>venosa</i>	Raggy scorpionfish	*	D

FAMILY	SPECIES	COMMON NAME	ABUNDANCE	METHOD
SERRANIDAE	* <i>Cephalopholis hemistiktos</i>	Red Sea grouper	+	D
	<i>Epinephelus stoliczkae</i>	Epaullet grouper	**	D
TETRAODONTIDAE	* <i>Canthigaster valentini</i>	Valentin's sharpnose puffer	+	D
ZANCLIDAE	<i>Zanclus canescens</i>	Moonish idol	+	D

(Note: A question mark following the species name indicates some uncertainty in identification of the species in that genus.)

Abundance

* few seen

** fairly common

*** very common

Method observed

D = Diving (Snorkel diving, 4-6 m depth)

L = Line-fishing (fishing by the survey team)

(Note: The giant kingfish (*Caranx ignobilis*) was caught on a lure trolling on the way home.)

their hospitality to us in the field and provided us with information.

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VOCALISATION IN THE SOUTHERN TREE HYRAX *DENDROHYRAX ARBOREUS*

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INTRODUCTION

The southern tree hyrax *Dendrohyrax arboreus* (figure 1) is a small (1.5–3.00 kg) ungulate of the Order Hyracoidea Family Procaviidae. The genus *Dendrohyrax*, the tree hyraxes, is restricted to Africa. There are three species: the western tree hyrax *D. dorsalis* is found in West and Central Africa as far East as Uganda, the southern tree hyrax *D. arboreus* occurs from eastern Democratic Republic of Congo east and south as far as the eastern side of southern Africa as well as in the Cape Province, and the eastern tree hyrax *D. validus* occurring only in eastern Tanzania, the Coast of Kenya and some Islands of East Africa (Bothma, 1971; Kunduchi, 1976; Seibt *et al.*, 1977).

Various authors (Milner & Harris, 1999; Richard, 1964; Rahm, 1957; Jones, 1978; Fey, 1960) mention vocalisation of both captive and free



Figure 1. Southern tree hyrax *Dendrohyrax arboreus*.

living hyraxes of various species. While periodicity and seasonality of the Great Calls, very loud sounds that carry to a considerable distance and are heard mostly at night, have been commented on, little is mentioned in the literature about any of the other vocalisations presented in this paper.

MATERIALS AND METHODS

A small captive population of southern tree hyraxes was studied between December 1978 and December 1988. All sounds except the Great Calls were recorded only from this group; some Great Calls were also been recorded from free living animals.

The group consisted of an adult male and female and their offspring of both sexes from six litters.

Vocalisations were recorded on check-sheets as well as on tape-recorders. Some of the latter were subsequently analysed with sonograms.

The tree hyraxes spent most of the time in a wire mesh enclosure 8 m x 3.5 m x 2.4 m high, which was separated from the observation room by a door and louver windows. During observations the door and louvers were usually opened allowing the animals to explore the observation room.

Night observations were also conducted, especially when new-born were present. At other times the Great Calls were heard in the nearby house at night and recorded, although without knowing who the caller was.

Some Great Calls from free living

hyraxes around a house in the Nairobi suburb of Langata were recorded during many nights by one of us (P.F.).

RESULTS AND DISCUSSION

Altogether twenty-eight different sounds were noted, of which five were non-vocally produced. The one most often mentioned in the literature is the Great Call. It is evident when comparing tape recordings of Great Calls of the western tree hyrax with those of the eastern tree hyrax of this study, that these calls differ between species.

Most other sounds reported here can only be heard from close-up and thus were not recorded by previous observers of wild populations.

The Great Call

The Great Call of the southern tree hyrax consists of two distinctly different sounds. Initially there is a croak (winding up) averaging 4 (maximum 16) repetitions, followed by a very loud penetrating scream averaging 7.8 (maximum 15) repeats. If an individual engaged in several bouts of screaming, the first call was always preceded by a higher number of croaks than the subsequent calls.

Examining the average and maximum number of both kinds of sounds, individual differences can be observed which, together with other characteristics of the sound make it probable that the animals recognise the individuals calling.

This study has definitely

established that both sexes produce the Great Call and also the circumstances under which they are made.

The adult female had been caught a year before the male and during this period when no male was present she had called at intervals of 20–30 days for periods of 2–3 days. This is similar to the periodicity of observed bouts of copulation at 2–3 week intervals. She was last heard to call on 16 December, 1979; the adult male joined her on 19 December. For the next ten years she was never known to call again. Captive female jaguars and leopards have also been known to call only when no male is present (G. Peters, pers. comm.).

While, for the female, the call has to be seen in a sexual context, for the male it seems to have mostly territorial significance as also observed by Richard (1964). The male first called 8 months after arrival and then in response to the taped call of the female. For the first several months he seemed under severe stress. Subsequently he reacted to taped calls of any hyrax by showing great excitement and himself calling.

When examining the periodicity of the male's call it became evident that it was also connected with breeding activity. Sixty percent of copulation periods coincided with his most active calling periods. This may be because of heightened territoriality during breeding activity.

Young males first called at sexual maturity aged 20–30 months.

Although the female called almost exclusively by day (50 out of 53 calls) all other animals called almost only at

night.

In the wild this call is mostly heard by night, although there are reports from many areas of daytime calls. In one instance free living hyraxes always called in response to passing trains whistling at midday in the Muguga area (John Guthrie, pers. com.).

The calls are not evenly distributed during the night and certain peak times are evident. In the present study, in the captive animals, two peaks occurred during the night, first between 21:00–23:00 hrs and again between 2:00–5:00 hrs (Figure 2). Similar peaks were found in the free living hyrax in Langata.

Various authors report similar periods of calling in the wild, *i.e.* 20:00–23:00 hrs (Rahm, 1957), 20:00–23:00 hrs and 3:00–5:00 hrs (Kingdon, 1974), 21:00–22:30 hrs and 2:00–3:00 hrs (Fey, 1960).

Except in the case of the adult female, members of the captive colony called more when the light was on in the hyrax cage and during moonlight ($n=214$, 68% light, 32% dark) than when it was dark. From the free living population in Langata, many more calls were heard during dark than during moonlit nights (30 as opposed to 130). This discrepancy between the free living and captive populations is unclear.

This study cannot answer the question of seasonal distribution of calls. However, Milner & Harris (1999) report that the western tree hyrax called more during the dry than the wet season, while a report from Nanyuki in Kenya indicated more calls

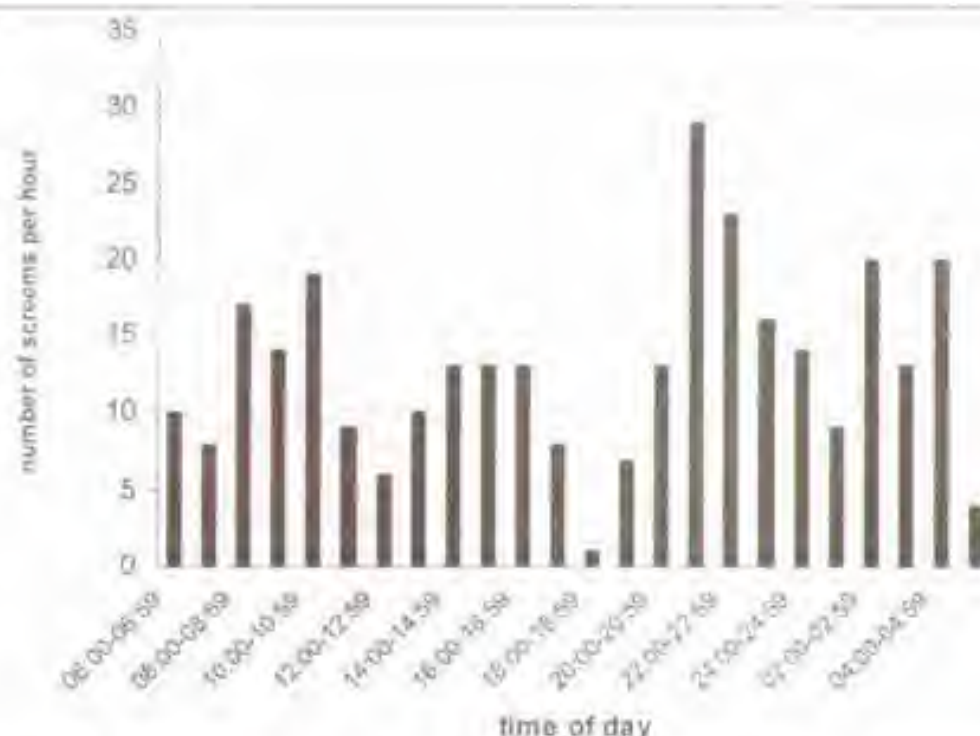


Figure 2. Temporal distribution of Great Calls of captive *Dendrohyrax arboreus*.

during the rains (Mrs Jacobson, pers. com.) Richard (1964) and Kingdon (1974) also heard more calls during the dry season.

Other sounds

While the Great Call is the best known, there is a large number and variety of other sounds produced by the hyrax in this study.

Contact sounds or those with an unknown stimulus

Glucking

This is a soft ticking made when exploring new objects, soliciting offered foods, and upon entering the observation room. It was produced most commonly by the adult female, especially when accompanied by young. It was rarely made by the male

and only after he had been in captivity for some months. The young make it early, but rarely. Perhaps it is for reassurance.

Moaning

A single low murmur, it is only made by the adult male, either when approaching the female during courtship, or in response to a plane flying overhead. The mouth is slightly open, head slightly raised and flanks heaving.

Soft twitter

This is a succession of soft tremulous sounds uttered by juveniles when approaching or being approached by others. The young make it when soliciting suckling. The upper lip is lifted, the mouth closed and the lips

quivering. The female's response is to become alert and approach.

Wail

This is a plaintive sounding soft cry made by the adult female during oestrous. She makes it when approaching the courting male and when at the latrine during the courting period and after copulation. It is made with the mouth slightly open and head thrust forward.

Gurring

An often repeated single sound (every 15 sec. to two min.), it was made only by two adult females. It was made in bouts lasting over 15 minutes and always while resting. It may be the same sound as "bleating" observed by Milner & Harris (1999). It has no apparent stimulus.

Anticipatory or sucking grunt

A low gruff sound, it is uttered by the male or female when approaching each other during courtship, investigating a new object, and by the mother while young are suckling. It is also made when anticipating offered food. When uttered by mother suckling young it starts 10 sec. after the beginning of suckling. The flanks heave with each sound and the body rocks forward and backward.

Agonistic, alarm, tension or protest sounds

Scream-yelp

This sound is a raucous, harsh cry uttered by females protesting attempted mounting by the male, or

when held in the hand. It is apparently a startle response.

Quack

A sound like that made by a duck, this is made when one animal is being approached by another. It may be protest, startle or a defensive threat.

Creak

A sound like an unoiled hinge, it is made in moments of uncertainty, as a protest or a slight threat.

Harsh twitter

This is like the soft twitter, but harsher. It is produced by juveniles when they move towards another animal or are approached by another. It causes the mother, or other animals, to become alert. It's sonographic similarity to the screech indicates that it later develops into this call.

Bark

A single sound, it is repeated no more than twice and is in response to seeing a dog or a cat. It is a startle response and the animals become alert.

Screech

This is a harsh, loud, high-pitched sound, repeated several times, usually by a juvenile male during an aggressive interaction, in response to another animal's screech, or by a female inspecting the primary home after another animal has visited it. Usually the animal screeching shows a high degree of excitement and rushes around. The response is alertness; juveniles approach the one making the

sound, males make a tick sound. It is made with the mouth wide open, lips and tongue vibrating.

Tick, click

An apparent warning or alarm sound, it is a slight, repeated click given upon seeing a cat, dog or hearing a bird's alarm call or taped great call. Other animals become alert or bolt. The sound is made with the nostrils flared, mouth closed and throat throbbing, 1 click per three seconds. The animals can eat and tick at the same time.

Bleat

Similar to a sheep's call, this sound is made during aggression or when an animal is frustrated. It results in the retreat of the other animal. It is made with an open mouth.

Khaa!

This is an explosive cough, made when startled or cornered. It was heard when escaping from a trap as the door was closed.

Snort

Like a horse's snort, it is made during aggressive or defensive threat, is a startle response, or a protest. It is made by forcing air through the nose. It was made when escaping being caught.

Blowing

This is made by exhaling air with the mouth slightly open. It is made during aggressive interactions or tense situations, mostly by the male.

After excitement yelp

A frequently repeated loud cry, it is

made after aggressive interaction, after the yelper or other individual has screeched. It is done by only the two adult females and one sub-adult male. The animal is stationary, the mouth slightly open and the body convulsing as if hiccuping.

Tooth grind

This is produced mostly by the adult male in moments of tension.

Lipsnack

Produced mostly by the adult male, it is done during aggressive interactions, as a reaction to taped screams, or at seeing a dog or cat. The tongue flicks in and out at the same time as the lips smack.

Mouthsnap

Again produced mostly by the adult male, it is done during aggressive interactions, moments of tension or uncertainty, or as a reaction to bird alarm calls. Often the white hair around the mid-dorsal gland is erected, indicating tension or excitement. Only the lips are involved and the sound is produced 1-2 times per second.

Squawk

This harsh sound like that of geese, is made with the lips retracted. It is mostly defensive, but is produced while moving towards another animal in an aggressive manner. The other animal usually turns away and departs.

Growl

This rumbling sound may be combined with a quack and is made when staring

at a snake, defending food, or during physical aggression and may cause the other animal to turn away. It is made with a closed mouth.

Zizz

Repeated every 1–3 seconds for several minutes, it is made when watching a cat approach, as a startle response or when alarmed. Other animals seek shelter.

Croak

Sounds like a frog, or the winding-up part of the great call and is made during moments of tension, protest, when a cat is near or when being caught. It may be produced when eating. Adult females may make it in response to young's twitter.

Nyam-nyam

This is a protest by the female when the male tries to mount.

Single scream

This is a single, harsh sound made by the adult female as a male tries to mount, or when chasing an adult male and trying to bite him. The male's response is to flee.

As can be seen from above, the majority of sounds heard in this study occurred in the context of tension or stress. This is consistent with the observed predominance of non-friendly interactions among these captive animals. Although there is no consensus on the social organisation of tree hyraxes, it is conjectured that they live, in contrast to the other genera in their order, a predominantly solitary

existence, congregating in small family groups only at certain times of year (Fey, 1960, Rahm, 1957).

Illustration by L. A. Depew from *Journal of East African Natural History* 83:1.

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LIFE ALL AROUND US: A NEW SERIES BY FLEUR NG'WENO

CORALS AND JELLYFISH: BUILDERS AND STINGERS

Cnidarians built the shoreline of East Africa. Millions and millions of tiny coral animals made the coral reef. A coral reef protects the shore, breaking the force of the waves. The living reef is like a garden under the sea, full of fishes and other marine life. Ancient reefs became our present shore, and old coral is used as building stones, and to manufacture cement.

Cnidarians are invertebrates—animals without backbones. Cnidarians include the corals, sea anemones, jellyfish and hydroids. They are named after their stinging capsules, *cnidae*, and were formerly known as Coelenterates. A cnidarian animal that lives fixed in one place is called a polyp, and one that looks and swims like a jellyfish is called a medusa.

Cnidarians look like flowers, but they are animals. Corals and sea anemones have a tube-shaped body. One end of the tube is attached to a solid surface. The other end is ringed with tentacles, which look like flower

petals. Sea anemones were named after a flower, the anemone of Europe.

Cnidarians live in the sea, and a few in fresh water. Corals and sea anemones usually live near the shore. You can see them if you walk out on rocky areas of the seacoast at low tide. Most corals live in tropical seas, around islands and on the eastern shores of continents. They need warm, clear water and plenty of sunlight. Sea anemones live on cold or warm seashores, all over the world. Most jellyfish are animals of the open ocean, floating on or near the surface of the sea. Sometimes a storm washes hundreds of jellyfish onto the beach. Hydraz and hydroids are small cnidarians that live in fresh or salt water.

Cnidarians are soft-bodied. They have simple bodies made of two layers of cells. Inside the body tube is a mouth and digestive system. Some jellyfish have large amounts of a substance like jelly between the body layers. This



The coral world.

gives them large, soft bodies. Coral polyps take minerals from seawater and build a hard, stony wall around themselves. The hard wall protects their soft bodies, and the mass of these walls forms the coral reef.

Cnidarians have stinging capsules That is how they catch their food. The tentacles around the mouth are usually full of stinging capsules. In the capsule is a thin rolled-up tube which carries poison. These tubes also have sharp piercing points. When a passing small animal touches the stinging capsule, it bursts open. The capsule shoots out the tube; the sharp points pierce the prey animal; and poison is injected through the tube. The poison may stun, kill or paralyse the prey. Other capsules send out a fine, sticky thread that entangles the prey

animal

Cnidarian stings are seldom dangerous to people. Most cnidarians catch tiny prey. When we touch them, we usually do not feel their stings. If you run your hand over a sea anemone's tentacles, you will get a tingling feeling. Its poison is not strong enough to hurt you. A few jellyfish, however, have tentacles with poison that is painful to people. Usually, these jellyfish live in the open sea, far off the coast of Kenya; but sometimes a storm blows them to shore. Watch out for any jellyfish with long, purple tentacles.

Cnidarians are food for many marine animals. Parrotfish grazing on coral polyps leave scrape marks on the hard coral. Huge leatherback turtles

feed mainly on jellyfish. Sea slugs, which are marine molluscs, eat sea anemones. The anemones' stinging capsules remain active, and become part of the sea slug's own defences.

Cnidarians may have algae in their tissues. Algae are living things like plants. In sunlight, they use water, minerals and carbon dioxide to make food. Some algae are large, but the ones living in corals and other cnidarians are very small. One alga may be just one single cell. Most coral polyps have single-celled algae in their bodies. In clear, shallow tropical seas, there is enough sunlight for algae to do their work of making food. The coral polyp eats food made by the algae, and the algae are protected by being inside the coral. Single-celled algae give some living corals and sea anemones a brilliant colour. There may be up to 30,000 single-celled algae in one cubic millimetre of polyp! The algae also help coral polyps to produce calcium carbonate to build their stony walls.

Cnidarians may grow big. Some of the jellyfish that live in cold waters may be three metres across. Their tentacles are more than 30 metres long. They are among the largest of all invertebrates.

Cnidarians may live long. One sea anemone was kept in an aquarium in California, USA, for 70 years. A fresh-water hydra, however, lives for just one season.

Cnidarians live as individuals or groups. A coral polyp usually builds a separate stony cup around itself. The 'mushroom coral' is a large polyp that lives alone in its mushroom-shaped cup. Other coral polyps build their stony walls close together, forming a colony. The whole colony has a particular shape, such as plate coral. In a brain coral colony, there are grooves on the coral mass, instead of individual cups. The bodies of several coral polyps are together in the same groove. Some jellyfish are really many animals grouped together into what looks like one jellyfish.

Cnidarians reproduce in two ways. A polyp may form a bud which breaks off as a new polyp. This is called asexual reproduction. A coral colony grows by budding. Coral polyps also shed sperm into the sea. Some sperms land on polyps containing eggs, and fertilise the eggs. Each fertilised egg becomes a free-floating larva. The larva later lands on a surface, becomes fixed, and begins to grow into a coral.

Some cnidarians have several life stages. One stage is a swimming animal like a jellyfish. This stage, called the medusa, sheds eggs and sperms into the sea. An egg is fertilised by a sperm, and becomes a little larva. The larva lands on a solid surface and grows into a polyp. The polyp may bud into other polyps and form a colony. Eventually, little medusae bud off from the polyp or colony. They break off, swim away, and the cycle begins again. Corals do not have a medusa

stage, and many jellyfish do not have a polyp stage.

JELLYFISH

Two-thirds of the Earth's surface is covered by oceans, and all over the oceans there are jellyfish. A jellyfish is usually shaped like a bell, or an overturned bowl. Between the outer and inner layers of cells there may be a layer of thick, clear jelly. The jellyfish's mouth is inside the 'bell'. Jellyfish swim by contracting and relaxing their bodies; or they simply float. Jellyfish feed on small animals in the open sea. They catch their prey with stinging capsules. A few jellyfish have tiny algae in the tissues around their mouth. They float upside-down, so the algae get plenty of sunlight to make food.

Moon jellyfish *Aurelia aurita*

Moon jellyfish are found in all seas. They are about the size and shape of an orange cut in half, but clear and almost colourless. From a boat, you may see thousands of moon jellyfish drifting with the currents near the surface of the sea.

Note: The Comb Jellies are small, delicate, transparent animals. They are abundant in the ocean, from the surface to great depths. Many of them are luminescent (light-



Moon jellyfish

producing). Scientists place Comb Jellies in a separate group, the Phylum Ctenophora.

HYDROZOANS

These cnidarians all have stinging capsules, which they use for feeding and defense. Most hydrozoans are colonial, many individuals living together, and acting like one organism.

By-the-wind-Sailor *Velella velella*

After a storm, the beach may be littered with violet discs about the size of a shilling. On each disc is a small stiff sail that seems to be made of plastic. These discs are the bodies of, the by-the-wind-sailor. Millions of *Velella* float on the surface of warm seas. They are blown about by the wind on their stiff clear sails. They catch tiny plankton for food. Plankton is composed of many small living things floating near the surface of the sea.

A *Velella* is actually a group of

animals living and working together. Each animal is called a polyp, and the group is called a colony. The polyps all share the same food from one digestive area. Each violet tentacle is a protective polyp. It contains stinging cells to catch food and protect the colony. One large feeding polyp is shaped like a mouth. Other polyps are reproductive polyps; they bud off tiny medusae which will grow into new *Verella* colonies. This strange arrangement is a little like a termite colony. Termites have workers, soldiers, and reproductive adults, all sharing the same home and food.

Porpita

Porpita is another flat, floating, violet-coloured hydrozoan of the ocean surface that may be washed to shore.

Fire Coral

Fire coral (*Millepora* spp.) colonies look like underwater ferns or branching corals. There is a big difference, however: fire corals sting! The stings are painful but not usually dangerous.

Portuguese Man-of-War

Sometimes a storm at sea blows Portuguese men-of-war (*Physalia physalis*) to the beach. They look like tiny polythene bags full of air, with trailing violet threads. Each of them is a hydrozoan colony.

Out on the open ocean some Portuguese men-of-war grow large. The gas-filled float may be up to 30 centimetres long, and tinged with blue, red or purple colours. Under the float

are feeding, stinging and reproductive polyps. The stinging polyps become tentacles up to fifteen metres long.

To British sailors of long ago, the bright floats looked like the sails of Portuguese warships. A warship was called a "man of war", sometimes said "man o' war". The animals floated in the same waters that the Portuguese ships explored.

The violet tentacles of Portuguese men-of-war have powerful stinging cells. The long tentacles stun and catch fish and other animals that swim past them. They can also sting people severely. Even a small man-of-war can give you a painful sting. If you get stung, get out of the water. Do not wash with fresh water, as fresh water triggers the stinging capsules! Rub alcohol on the stings. The stings may leave scars for several days, but they will eventually fade.

Hydra

In fresh water, tiny hydra live attached to rocks and plants. Each hydra is a separate animal, about one centimetre long. It has a cylindrical body and about six long tentacles. The hydra can



Hydra (greatly enlarged)

pull back its tentacles and contract into a little lump.

Hydras feed on fresh water plankton animals. They catch their prey with the stinging capsules and thread capsules in their tentacles. Hydras can glide from place to place, and also move by turning over and over.

Other Hydroids

On the coral reef, many living things live on top of other living things. Look closely at a blade of sea grass, a bunch of seaweed, or a mass of coral. You may see a delicate white growth, like a tiny branching plant. It is one of the hydroid, a colony of animals, related to *Velella*.

There are many polyps living together in each little hydroid. The polyps feed on plankton, tiny living things that float in the sea. A hydroid colony grows by budding new polyps. At certain times, the hydroid also forms reproductive polyps. They produce tiny jellyfish-like medusae.

Some of the small medusae are males, and others are females. They shed their eggs and sperms into the sea. A sperm fertilises an egg, and the egg grows into a larva. The larva swims for a while, then settles down on a surface. It becomes attached, develops tentacles, and buds off new polyps to form a hydroid colony.

SEA ANEMONES

Sea Anemones are animals that look like flowers. They live in the sea, all



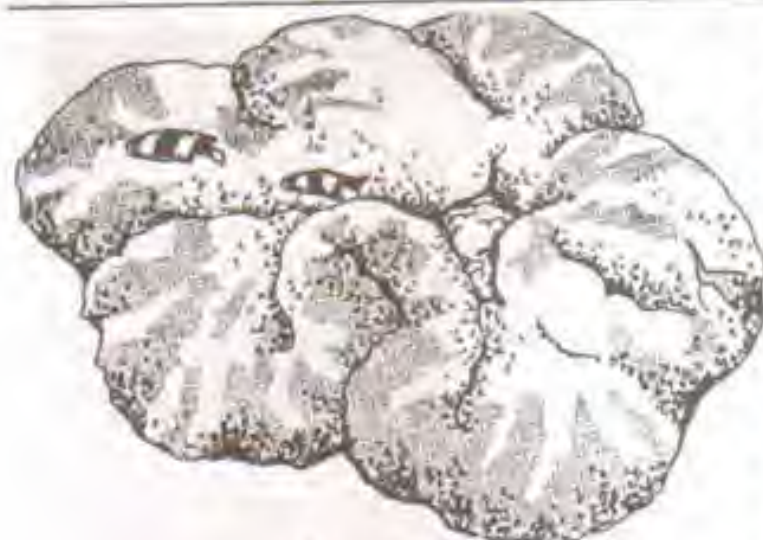
Hydroid colony (enlarged)

over the world.

At low tide along rocky shores, look in cracks, or hollows called tidepools. Small green anemones like little flowers often live along cracks in rocks, or the edge of tidepools. You may even find a small pink anemone growing on the shell of a crab or mollusc!

Sea anemones have a tube-shaped body. It is soft but tough, like rubber. The sea anemone clings to a surface at one end. On the other end is an opening called a mouth.

A sea anemone's mouth is surrounded by a ring of tentacles. The tentacles have stinging capsules and sticky thread capsules to stun and entangle small fish and other prey. When they sense danger, sea anemones can pull their tentacles back inside their bodies.



Sea anemone

On sandy beaches near the low tide mark you may find a large sea anemone. It is as big as a cabbage, but flatter in shape. Its central mouth is surrounded by hundreds of short tentacles. Stings from the tentacles will not hurt you, but can stun a little fish.

Look carefully at the living anemone. You may see tiny fish swim over the tentacles or along the edge of the anemone. Young clownfish and domino fish live in association with the anemone. Some of the stinging capsules stick to them; the anemone recognises them and does not sting them again. When they sense danger, the fish rush to hide in or under the big anemone.

Other small fish that swim by, however, are stung and eaten by the anemone. The anemone catches them with its tentacles, like a spider catches flies in its web.

In the sea, many fish are associated with bigger creatures. Pilot fish, for example, follow large sharks or

whales, and eat the scraps from the animal's meals. When two living things live in an association which benefits both sides, it is called symbiosis.

Algae also live with the sea anemone, but they are hidden within its tissues. Tiny single-celled algae give the anemone its green colour. As the

anemone lies in shallow water in the sunlight, the plants inside its tentacles make food. The algae, in turn, are protected from danger by living inside the sea anemone.

A big anemone lives for many years, even decades! It usually stays in the same place, but it can move, slowly, by gliding along the surface. Some anemones jostle and push each other for a good site on the coral reef.

SOFT CORALS

Soft corals build colonies that are leathery or rubbery rather than stony. Like the stony corals, they live in the sea near the shore.

One kind of soft coral looks like a bunch of pale grey or pink flowers. It lives among sea grasses on sandy bottoms in shallow water between the reef and shore. Another soft coral looks like a piece of plastic or rubber lying on the reef.

In deeper water, there are soft corals with delicate branching shapes and bright colours. Soft coral polyps have eight fringed tentacles. Sea anemones and stony corals have many narrow tentacles, usually in multiples of six.

Organ-pipe and precious coral

When the polyps of stony corals die, their stony homes become white in colour. There are a few corals, however, which make coloured structures.

Organ-pipe coral (*Tubipora musica*) is related to the soft corals. Its large polyps are brown in colour, with eight feathery tentacles. A mass of living organ-pipe seems covered with thick brown fur. If you touch the



Organ-pipe coral

polyps, they draw back into their "homes".

Each polyp lives in a tube, like the pipes of an organ. The tubes are dark red in colour, and are connected by horizontal plates. You may find pieces of dark red organ-pipe coral washed up on the beach.

Precious coral lives in the Mediterranean Sea. Its polyps build a central core of pink or red limestone. When the polyps die, the precious coral is collected and sold for making jewelry.



Soft coral

STONY CORALS

The whole length of the Kenya coast is lined by a coral reef. The reef is a solid wall, broken only where rivers and creeks enter the sea. At low tide the waves crash on the reef, making a booming sound.

In some places the shore slopes directly to the reef. In



Coral polyp begins to build (much enlarged)

other places the reef is separated from the shore by an area of water, called the lagoon.

The reef is made by tiny coral animals. Each coral animal, called a polyp, is small and soft. But it can take minerals from sea water and build a wall around itself. Together, millions and millions of coral polyps build the massive coral reef.

Each coral polyp is like a little sea anemone: a tube-shaped body with tentacles at one end. The base of each coral polyp is divided into many fine sections. And all around itself, the polyp builds walls of lime (calcium carbonate).

A coral colony begins with a coral larva from a fertilised egg. The larva drifts in the sea, then lands on a solid surface. From its base, the larva begins to build a star-shaped stony foundation. It continues to build, making a stony

cup around itself.

The coral animal, now called a polyp, buds into more polyps. Each polyp continues to build, forming a coral colony. When polyps die, other polyps build over and around them.

There are many kinds of corals, each building a different kind of stony shape. Many corals are rounded masses. Others are like plates, like branching horns, or like mushrooms in shape.

The polyps live in their stony homes. They

spread their tentacles out over the stony cups. They catch and eat tiny plankton creatures. When they are not feeding, they pull their tentacles back inside their stony homes.

Some polyps are so small that you can hardly see them in the stony mass. Other polyps are large, and may be brightly coloured. When they die, you can see the holes where they lived, with a starlike pattern on the bottom.

Many coral polyps have single-celled algae living inside their tentacles. These algae are called zooxanthellae. The tiny algae make food in sunlight through photosynthesis. They help to feed the coral polyps and to give them their bright colours. Scientists think that in some way the algae also help the corals to get the calcium carbonate to build their stony homes.

The coral reef is not smooth. It is

full of bumps and hollows, overhangs and tunnels, caves and hiding places. A multitude of colourful plants and animals live on the reef and in its caves and hollows. Reef-building corals help to create a wonderful world under the sea.

ACKNOWLEDGMENTS

Illustrations from *Rainbow* magazine November & December 1989 by Nani Croze and Arabron Osanya-Nyeneque.

Coral polyp beginning to build, drawing by Nani Croze, based on a photo by Robert Sisson in *National Geographic* magazine.

An earlier version of this series of articles first appeared in *Rainbow* magazine.

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Short communications

IT'S GETTING DARK AND WE'VE NOWHERE TO SLEEP

Marlene Reid

Fort Jesus Museum

P.O. Box 82412, Mombasa, Kenya

Bronze Manikin *Lonchura cucullata* Kenyan: "a common species" according to the Bird Atlas of Kenya (Lewis & Pomeroy), so common in fact that we often pay no attention to it and hardly ever see anything written to celebrate its existence. A dismissive

"LBJ" ("little brown job" for those who don't already know) to most people. In Dar es Salaam they used to build nests in my bathroom louvres and I paid little attention to them, but since moving to Tudor, Mombasa, I have been compelled to take much more

notice of them as they try to live on my verandah and sometimes in my lounge, almost members of the family.

I have now come to the conclusion that they are absolutely mad (which fits in well with the rest of my family members) as well as fascinating, in their frantic, dashing behaviour.

When we first moved in they invaded the lounge, maybe because the flat had been empty for a year or so and they saw it was a whole new stomping ground. They spent hours and hours bringing their nesting materials onto the curtain rail where it would drift gently down behind the TV. This never seemed to faze them and at the end of each day there would be an empty curtain rail and a pile of grass on the floor. They have now become a little disillusioned with that and build with varying degrees of success in my husband's *Gloriosa* and *Petria* (neither of which ever flowers; well we do sometimes have the odd blue straggle on the *Petria*).

Nests differ through the whole range of building techniques, from stable and moderately stable down to the very flimsy, and it never seems clear which birds actually own the nest. They never manage more than one nest despite the large number of birds.

There are degrees of activity during the day when small flocks of females and juveniles seem to chase lone males round the garden, often crowding him off his chosen perching place, but the really frantic activity always occurs around dusk when the whole flock goes absolutely mad, dashing

around the verandah, climbing into the nest (if there is one or onto the bare trellis if there is not): often one bird piled upon another. Much fighting and fighting goes on, so much sometimes that the nest falls off its precarious perch, fortunately, so far, without loss of life.

Some evenings when I am sitting watching the fading golden light, they will all fly in and settle in the criss-cross holes of the verandah rail, arriving with a great rush of wings. One bird per hole, males, females and juveniles. A couple of weeks ago they all flew into one of the armchairs, perching on the cushions to watch me expectantly. Then up and off in their desperate attempt to find a pad for the night.

It seems that they spend all daylight hours flying backwards and forwards between the various trees feeding and whatnot and only look for roosting places in a big panic once the light starts to fade. The most amazing thing is that the male bird that ends up in the nest often spends most of the evening flitting around the verandah or climbing up the wind-chimes.

There are nests on the verandah above mine and I think that sometimes they get confused as to which floor they are on (bit like me in multi-story car parks). Quite frankly these little birds are a source of constant amusement to both me and my husband and all our visitors, and while they are often overlooked by others and do not rank as a special bird to see, in my house, they are very much noticed.

Society projects

SUCCULENTA EAST AFRICA

This is a group of people who are interested in succulent plants, i.e. plants of arid areas with fleshy leaves or stems that enable them to survive long periods of drought.

Activities of the group are organised by a committee, comprising:

Chairman - Prof. Len Newton.
Secretary - Maria Dodds.
Assistant secretary & seed exchange organiser - Anne Powys.
Functions organiser - Sue Allan.
Assistant functions organiser - Christa von Kalckstein.
Newsletter editors - Clare Gaier & Carin Parfitt.
Member - Dee Roberts.

The aims of the group are the cultivation, conservation and study of succulent plants. To achieve these aims, Succulenta East Africa members are engaged in the following activities:

1. Monthly meetings, including garden meetings, lectures and field trips.
2. Publication of an informative bulletin, "Ballya", from 1993 to 1998.
3. Publication of a bimonthly Newsletter.

4. Active support for the botanical garden of the National Museums of Kenya. Members have been working closely with the manager and staff of the garden in the design, planting up, and maintenance of the large succulent plant section next to the snake park.
5. The group also established a succulent plant rockery in the Nairobi Arboretum.

For the immediate future we aim to continue with our regular meetings and field trips, and to continue active support of the botanical garden. We are also planning to look at the possibility of resuscitating a succulent plant reserve area that had been established many years ago outside Nairobi.

For more information, contact the Chairman (tel. 812722 ext. 277; e-mail: lnewton@avu.org) or the Secretary (tel. 882828; e-mail: dodds@swift-kenya.com).

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Other Society Publications

The *Journal of East African Natural History* is published in collaboration with the National Museums of Kenya. It is published two times a year. Contributions must follow the style directed in the Notice to Contributors found in the back of every issue of the JEANH and should be sent to the Editor, Journal of East African Natural History, P.O. Box 44486, Nairobi, Kenya.

E-mail: eanhs@africaonline.co.ke

Scopus is the publication of the Bird Committee of the EANHS. It is published two times per year. All correspondence should be sent to D.A. Turner, Box 48019, Nairobi, Kenya.

Kenya Birds is a publication of the Bird Committee in conjunction with the Ornithology Dept., NMK. It is published two times per year and contains popular and informative articles on birds and birding in Kenya. Correspondence should be sent to Dr Leon Bennun, Box 44486, Nairobi, Kenya.

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Front cover: Portuguese man of War *Physalia physalis* by L.A. Depew
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NatureKenya



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